

## NOTES ON THE COMPOSITAE OF THE NORTH-EASTERN UNITED STATES. II. HELIANTHEAE AND HELENIEAE

ARTHUR CRONQUIST

The first paper of this series appeared in RHODORA 47: 182-184. 1945.

AMBROSIA TRIFIDA L. var. **trifida**, nom. nov. *A. trifida* L. Sp. Pl. 987. 1753, sens. strict.

BIDENS VULGATA Greene var. **vulgata**, nom. nov. *B. vulgata* Greene, Pitt. 4: 72. 1899, sens. strict.

The North American species of *Coreopsis* with yellow rays, greatly reduced upper leaves, and fimbriate or pectinately toothed achaenial wings were treated by Asa Gray as two species, *C. gladiata* Walt., with alternate, elongate, and relatively broad leaves, and *C. angustifolia* Ait., with mostly opposite, shorter, and relatively narrow leaves. Some other names which have been applied to plants of this group are *C. linifolia* Nutt., *C. longifolia* Small, *C. falcata* Boynton, *C. oniscicarpa* Fern., and *C. oniscicarpa* var. *simulans* Fern. In general these plants may be sorted into the groups made out by Gray, but there are so many intermediates that it seems unwise to maintain them as distinct species. There has been some doubt as to the identity of *C. angustifolia*, Sherff (Field Mus. Pub. Bot. 11: 407. 1936) considering it to have narrow but elongate and alternate leaves. Nuttall's name *C. linifolia* has been taken up by Sherff and others for the plant with small and narrow opposite leaves. The only varietal name thus far used in the group is *C. oniscicarpa* var. *simulans*, applied to a plant with broad opposite leaves, thus squarely between the two main intraspecific groups. Just as a binomial applied to an intraspecific hybrid need not be used for either of the parents, so, I believe, the var. *simulans* need not be taken up for either of the two varieties between which it stands. Plants of this alliance, as I understand them, may be treated as follows:

COREOPSIS GLADIATA Walt. var. **gladiata**, nom. nov. *C. gladiata* Walt. Fl. Carol. 215. 1788, sens. strict. Leaves all or nearly all alternate, the lower ones greatly elongate, mostly 1-3.5 cm. wide; stem mostly terete.

COREOPSIS GLADIATA Walt. var. **linifolia** (Nutt.) comb. nov. *C. linifolia* Nutt. Journ. Acad. Philad. 7: 75. 1834. Leaves

(or at least the middle and upper ones) mostly or all opposite, the lower ones not greatly elongate, mostly 0.3–1 cm. wide; stem tending to be quadrangular.

The rays of var. *gladiata* average a little longer than those of var. *linifolia*, as noted by Gray, but the difference is entirely inconstant and not at all to be depended on. The differences which have been noted by various students in the size and shape of the involucral bracts, and size of the achenes and their wings, seem to me too variable to be of much assistance. No difference in the range of the two varieties can be discerned from our specimens and the previous treatments.

COREOPSIS LANCEOLATA L. var. **lanceolata**, nom. nov. *C. lanceolata* L. Sp. Pl. 908. 1753, sens. strict.

COREOPSIS MAJOR Walt. var. **major**, nom. nov. *C. major* Walt. Fl. Carol. 214. 1788, sens. strict.

*Echinacea laevigata* (Boynton & Beadle) Blake is a rare plant that differs from *E. purpurea* in being glabrous throughout. Its range is almost entirely included within that of *E. purpurea*, but is much more restricted. *E. purpurea* ordinarily has both the stem and the leaves conspicuously hirsute, but individuals with the stem essentially glabrous are not uncommon. A specimen in the herbarium of the New York Botanical Garden (*Murrill s. n.*, Lynchburg, Va.), annotated *E. laevigata* by Sharp, has the upper surface of the leaves short-hirsute, but is otherwise essentially glabrous. In the absence of any other distinguishing feature, *E. laevigata* can scarcely stand as a species.

ECHINACEA PURPUREA Moench var. **purpurea**, nom. nov. *E. purpurea* Moench, Meth. Pl. 591. 1794, sens. strict.

ECHINACEA PURPUREA Moench var. **laevigata** (Boynton & Beadle), comb. nov. *Brauneria laevigata* Boynton & Beadle in Small, Fl. S. E. U. S. 1261. 1903.

*Echinacea atrorubens* Nutt., described from Arkansas, is represented in the herbarium of the New York Botanical Garden by specimens from Oklahoma and Texas. A tracing of part of the type collection, with detailed drawings of certain parts, is also on deposit. *E. paradoxa* (Norton) Britton & Brown is represented by several specimens from Missouri and a few from Oklahoma and Texas, and specimens from these states only are cited by Sharp (Ann. Mo. Bot. Gard. 22: 95. 1935). The ranges of the two species, although not identical, are seen to cover much of

the same territory. E. J. Palmer pointed out in 1936 (RHODORA 38: 197-199) that the two species are very much alike except for the color of the ligules, these being purple in *E. atrorubens*, and yellow in *E. paradoxa*. The two other minor differences which he suggested, the sometimes longer ligules of *E. atrorubens*, and the sometimes wider leaves of *E. paradoxa*, nearly vanish when our specimens are examined. In the absence of any other distinguishing feature, it seems unwise to maintain the two species as distinct.

ECHINACEA ATRORUBENS Nutt. var. **atrorubens**, nom. nov. *E. atrorubens* Nutt. Trans. Am. Phil. Soc. n. ser. 7: 354. 1840, sens. strict.

ECHINACEA ATRORUBENS Nutt. var. **paradoxa** (Norton), comb. nov. *Brauneria paradoxa* Norton, Trans. Acad. Sci. St. Louis 12: 40. 1902.

It may be noted that *E. atrorubens* has nearly from the first been confused with a southeastern species of *Rudbeckia*. A full and apparently correct discussion was published in 1901 by Boynton & Beadle (Bilt. Bot. Stud. 1: 11-12), but as late as 1935 Sharp excluded it from *Echinacea* with only the following comment: "Small in 'Flora of the Southeastern United States' . . . included six species, four of which are retained in this monograph, one reduced to a variety, and the sixth being excluded." (Ann. Mo. Bot. Gard. 22: 85. 1935.)

Dr. Fernald, following Exell (Cat. Vasc. Pl. S. Tome 225. 1944), has recently maintained (RHODORA 47: 196-7. 1945) that the name *Eclipta alba* (L.) Hassk. must be replaced by *Eclipta prostrata* (L.) L. Linnaeus, in the Species Plantarum, proposed among others two species of *Verbesina*, *V. alba* and *V. prostrata*. Later (Mant. 286. 1771) he transferred both these species to *Eclipta*, but substituted the epithet *erecta* for *alba*, thus coining the illegitimate name *E. erecta*, a nomenclatural synonym of *Verbesina alba*. Later (in 1848) Hasskarl published the combination *Eclipta alba*, based on *Verbesina alba* L., and indicated that *E. prostrata* might or might not be sufficiently distinct to warrant recognition.

Fernald says "Since *Verbesina alba* L. and *V. prostrata* L. are considered conspecific and are of even date, the first of them taken up must stand. This is *E. prostrata* (L.) L. (1771)". The pertinent statement in Article 56 of the Rules is as follows: "If the

names or epithets are of the same date, the author who unites the groups has the right of choosing one of them. The author who first adopts one of them, definitely treating another as a synonym or referring it to a subordinate group, must be followed." Note that the two species were not combined by Linnaeus in the Mantissa. The fact that *prostrata* was the first legitimate epithet to be used in *Eclipta* has no bearing on the matter; the Kew Rule has been repudiated by the International Code. The two epithets, *alba* and *prostrata*, are still of the same date; therefore the first author to unite them definitely under one name or the other must be followed. Hasskarl's treatment, in which he indicated that *E. prostrata* might or might not be distinct from *E. alba*, is not sufficiently definite to fulfill the requirement of Article 56 in setting the precedent. The first definite use of one name to cover both species, so far as I am aware, is that of Miquel, in the Fl. Ind. Bat. 2: 65. 1856<sup>1</sup>, where *E. alba* is used and *E. prostrata* relegated to varietal status. This usage, with *E. prostrata* as a variety or synonym of *E. alba*, was adopted successively in Oliver's Flora of Tropical Africa, Hooker's Flora of British India, Martius' Flora Brasiliensis, and Gray's Synoptical Flora of North America, and is in general use today. Unless and until it can be shown that, prior to 1856, some author definitely united *E. prostrata* and *E. alba*, accepting the former epithet and relegating the latter to intraspecific status or synonymy, the name *E. alba* must stand as the proper one.

HELIANTHUS ATRORUBENS L. var. **atorubens**, nom. nov. *H. atrorubens* L. Sp. Pl. 906. 1753, sens. strict.

HELIANTHUS OCCIDENTALIS Riddell var. **occidentalis**, nom. nov. *H. occidentalis* Riddell, Suppl. Cat. Ohio Pl. 13. 1836, sens. strict.

HELIANTHUS TUBEROSUS L. var. **tuberosus**, nom. nov. *H. tuberosus* L. Sp. Pl. 905, 1753, sens. strict.

PARTHENIUM INTEGRIFOLIUM L. var. **integrifolium**, nom. nov. *P. integrifolium* L. Sp. Pl. 988, 1753, sens. strict.

PARTHENIUM INTEGRIFOLIUM L. var. **auriculatum** (Britton) Cornelius in herb., comb. nov. *P. auriculatum* Britton, Ill. Fl. 3: 521. 1898.

Specimens in the herbarium of the New York Botanical Garden bear Miss Cornelius' label with the heretofore unpub-

<sup>1</sup> I have had the assistance of Dr. M. L. Fernald and Mr. C. A. Weatherby in arriving at this conclusion.

lished combination given above. Since her monograph of the genus *Parthenium* was completed more than 10 years ago, it seems unlikely that publication is now contemplated.

*Polymnia Uvedalia* L. var. *floridana* Blake (RHODORA 19: 48. 1917) and var. *densipilis* Blake (loc. cit.), both differing from var. *genuina* Blake in having the peduncles spreading-hairy, with few or obscure glands, are now known to be confluent in range, and are distinguished only by the most tenuous of characters. It seems proper to treat them both under the name *P. Uvedalia* L. var. *densipilis* Blake.

A considerable number of specific and varietal names has been proposed for the *Rudbeckias* in our area having the leaves entire or merely toothed, the receptacular bracts glabrous or ciliate, the style-appendages short, and the pappus evident. Among these names are *R. fulgida*, *R. spathulata*, *R. speciosa*, *R. Sullivantii*, *R. palustris*, *R. missouriensis*, *R. umbrosa*, and *R. Deamii*. While plants of this group show a great deal of variation in size and shape of the leaves, amount and orientation of pubescence, and length of rays, the variation seems to be essentially continuous. The oldest name, *R. fulgida* Ait., must therefore stand for the entire group. Four varieties, showing considerable intergradation, may be recognized in our range.

RUDBECKIA FULGIDA Ait. var. **Sullivantii** (Boynton & Beadle), comb. nov. *R. Sullivantii* Boynton & Beadle, Bilt. Bot. Stud. 1: 15. 1901. *R. speciosa* var. *Sullivantii* Robinson, RHODORA 10: 68. 1908. *R. speciosa* Wenderoth, Ind. Sem. Hort. Marb. 1828. Rays mostly 2.5–4 cm. long; leaves usually sharply toothed, commonly but not always relatively broad and only sparsely or moderately pubescent; involucre bracts mostly glabrous or strigose. Mostly in moist places; Mich. to Mo. and W. Va., and perhaps southward.

RUDBECKIA FULGIDA Ait. var. **umbrosa** (Boynton & Beadle), comb. nov. *R. umbrosa* Boynton & Beadle, Bilt. Bot. Stud. 1: 16. 1901. Rays mostly 1–2.5 cm. long; leaves not very sharply toothed, the cauline ones mostly ovate or broader and abruptly contracted to the wingless or narrowly winged petioles; herbage mostly only sparsely hairy; involucre mostly glabrous or strigose. Moist woodlands; Ky. to Tenn. and Ga.

RUDBECKIA FULGIDA Ait. var. **fulgida**, nom. nov. *R. fulgida* Ait. Hort. Kew. 3: 251. 1789, sens. strict. Rays mostly 1–2.5 cm. long, leaves mostly denticulate or subentire, the cauline mostly narrower than ovate and sessile or merely narrowed to

winged petioles or petioliform bases, nearly always at least some of them over 2 cm. wide; herbage usually only sparsely or moderately pubescent; involucre bracts mostly glabrous or strigose. Mostly in woodlands, but sometimes in drier or boggy places; Pa. to Ohio, Ind., Mo., and southward.

*RUDBECKIA FULGIDA* Ait. var. **missouriensis** (Engelm.), comb. nov. *R. missouriensis* Engelm. ex Boynton & Beadle, Bilt. Bot. Stud. 1: 17. 1901. Rays mostly 1–2.5 cm. long; leaves denticulate or subentire, narrow, even the basal ones rarely over 2 cm. wide; involucre bracts mostly spreading-hirsute; herbage densely spreading-hirsute. Mostly in dry open places; Mo. to Tex.

*RUDBECKIA LACINIATA* L. var. **laciniata**, nom. nov. *R. laciniata* L. Sp. Pl. 906. 1753, sens. strict.

*RUDBECKIA TRILOBA* L. var. **triloba**, nom. nov. *R. triloba* L. Sp. Pl. 907. 1753, sens. strict.

*Rudbeckia alismaefolia* T. & G. apparently differs from *R. grandiflora* Gmel. only in being less pubescent and in having usually more obtuse leaves. The two are habitually very much alike, and intermediates may be found. The necessary combinations follow.

*RUDBECKIA GRANDIFLORA* Gmel. var. **grandiflora**, nom. nov. *R. grandiflora* Gmel. ex DC. Prodr. 5: 556. 1836, sens. strict.

*RUDBECKIA GRANDIFLORA* Gmel. var. **alismaefolia** (T. & G.), comb. nov. *R. alismaefolia* T. & G. Fl. N. Am. 2: 310. 1841.

*SILPHIUM INTEGRIFOLIUM* Michx. var. **integrifolium**, nom. nov. *S. integrifolium* Michx. Fl. Bor. Am. 2: 146. 1803, sens. strict.

*SILPHIUM TRIFOLIATUM* L. var. **trifoliatum**, nom. nov. *S. trifoliatum* L. Sp. Pl. 920. 1753, sens. strict.

The genus *Verbesina* of Linnaeus included plants now referred to several distinct genera, and there has been some question to which of these the name should be applied. According to the list of proposed type species of Linnaean genera, as printed in the currently available edition of the International Rules, *V. alata* should be accepted as the type. This is in accordance with the treatments of Bentham, Hoffman, and Gray, and may well be adhered to. In the Genera Plantarum, Bentham separated *Actinomeris* Nutt., with 9 species, from *Verbesina* on the basis of its neutral rather than pistillate rays, noting that in habit and other features the two groups were very similar. It is now well known that several species of *Verbesina* may either lack or possess the style, however. Hoffman, and most American botanists,

have maintained *Actinomeris* (or one of its synonyms, such as *Ridan*) for two species with squarrosely spreading achenes and relatively few and soon deflexed involucre bracts. The type species of *Verbesina*, however, frequently has distinctly squarrose-spreading achenes, and the difference in the involucre is neither very great nor sharply defined. In view of the general habital similarity of the groups, their admittedly close relationship, and the absence of any well-marked differentiating character, it seems pointless to maintain the separation. *Actinomeris* Nutt. should be considered an integral part of *Verbesina* L. No new combinations are required. It may be noted that the combination *V. alternifolia* (L.) Britt., which appeared as a nomen nudum in Bull. Torrey Bot. Club **20**: 485. 1893, was validated by Mohr in Contr. U. S. Nat. Herb. **6**: 804. 1901.

The determination of species of *Xanthium* has become a formidable task, undertaken by many botanists only when it becomes unavoidable, and then with serious misgivings. More than 20 species are reputed to occur in North America. I am convinced that the only proper way out of the difficulty is that suggested by Wiegand in the Flora of the Cayuga Lake Basin. ("Several years ago I undertook a revision of the American *Xanthiums*, making use of the material in the Gray Herbarium. After a prolonged but unsuccessful effort to prepare a satisfactory treatment, the problem was laid aside. I am now greatly in doubt as to the existence of more than one real species in the group represented by *X. chinense* Mill., *X. pennsylvanicum* Wallr., *X. italicum* Mor., and other related forms. The foliage in these forms is practically identical, and the only differences of any moment are in the burs, which are indeed highly variable. Extreme forms of burs, however, are often found in the same colony, as though sporadically produced. A large suite of specimens is almost sure to show a nearly or quite unbroken series through the various forms. In every attempt to segregate the burs into species, so many transitional specimens have been found as to do unwarranted violence to any species concept. It is probably wise to treat all North American *Xanthiums* as one species except *X. spinosum* L. and possibly *X. strumarium* L. and *X. echinatum* Murr. *X. strumarium*, however, is scarcely distinct, and with more study may also be included. *X. echinatum* may be a real species, as it has a distinct coastal range, and seems

to behave as though genetically distinct . . .") I am completely in agreement with Wiegand's observations, except that *X. strumarium* sens. strict. seems no more than varietally distinct from our plants, and that I am quite unable to see any sort of taxonomic unit in *X. echinatum*. Our plants, as I understand them, may be treated as follows:

*XANTHIUM STRUMARIUM* L. sens. strict. Fruit straight-beaked, small, less than 2 cm. long, yellow-green, puberulent but not hirsute or markedly glandular. Common in Europe; also in Calif. and reputedly in Mass.

*XANTHIUM STRUMARIUM* L. var. **glabratum** (DC.), comb. nov. *X. macrocarpum* var. *glabratum* DC. Prodr. 5: 523. 1836. Fruits with more or less incurved beaks, usually small, seldom over 2 cm. long, usually brownish or yellowish-brown, atomiferous-glandular or slightly glandular-puberulent to subglabrous between the prickles, not hirsute. Sometimes closely resembling the preceding, sometimes passing into the following. Occurs throughout our range, but not so common as the next.

*XANTHIUM STRUMARIUM* L. var. **CANADENSE** (Mill.) T. & G. Fl. N. Am. 2: 294. 1841. *X. canadense* Mill. Gard. Dict. ed. 8. 1768. Fruits with evidently incurved beaks, usually large, commonly 2–3.5 cm. long, occasionally larger or smaller, generally brown or yellowish-brown, the lower part of the prickles conspicuously spreading-hirsute with viscid hairs, the surface between the prickles often stipitate-glandular. Occurs throughout our range.

Although both species of *Xanthium* have now become cosmopolitan weeds, and *X. strumarium* was well established in Europe four hundred years ago (according to Hegi), it seems probable that they originated in the new world. Except for a few species of *Ambrosia*, the subtribe *Ambrosinae* is otherwise exclusively American.

I am fully in agreement with Asa Gray that the plant treated in recent manuals as *Actinea herbacea* Greene is no more than varietally distinct from *A. acaulis* (Pursh) Spreng., but the proper varietal combination under *Actinea* has not yet been made.

*ACTINEA ACAULIS* (Pursh) Spreng. var. **glabra** (A. Gray), comb. nov. *Actinella scaposa* var. *glabra* A. Gray, Man. ed. 5. 263. 1867. *Actinella acaulis* var. *glabra* A. Gray, Syn. Fl. 2 (1): 345. 1884.

*HELENIUM AUTUMNALE* L. var. **autumnale**, nom. nov. *H. autumnale* L. Sp. Pl. 886. 1753, sens. strict.